

# **Enterprise** *Virtualization*

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*April 2012*



# Core Business Capabilities



- Nuclear Facilities Operation & Support
  - Complex Operations
  - Spent Fuel Services
  - Asset Liabilities Management
  - Large Scale Outsourcing
- Long-Term Risk Management Solutions
  - Long Term Contracts – Fixed & Reliable
  - Fixed Decommissioning Cost
  - Asset Liability Reduction (D&D)
- Nuclear Materials Management
  - Fuel (DFS) & New Fuel Supply (Coming)
  - Irradiated Hardware
  - High / Low-Activity Transport & Logistics
  - LLRW Management Solutions

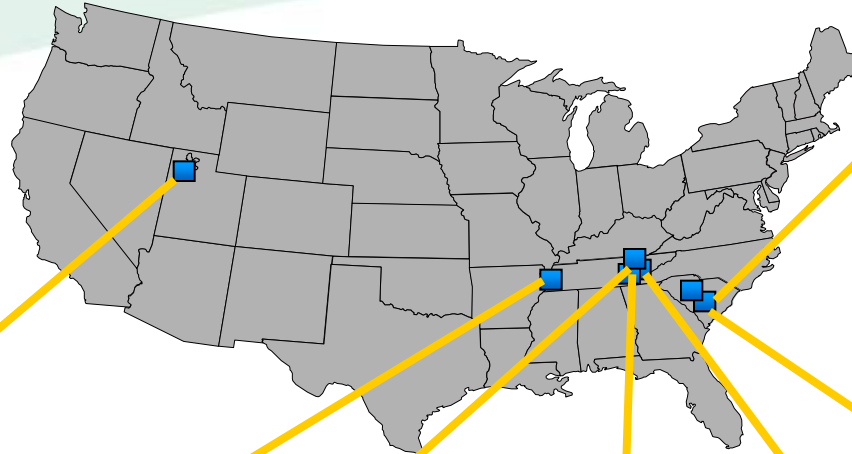
## Strategic Interests

- ✓ **Turn-Key Nuclear Materials & Facility Management**
- ✓ **Class B/C & IH Processing & Storage Solutions**
- ✓ **Partnership on New Builds and Acquisitions**
- ✓ **Building U.S. Based Fuel Supply and Reprocessing Infrastructure**
- ✓ **Nuclear Asset-Liability Management**

# US Facilities



- 5 Licensed Operations Facilities
- 2 Disposal Facilities
- Logistics Operations



**Clive Disposal**

**Clive, UT**

**Chem-Nuclear Disposal**



**Barnwell Processing**



**Memphis Operations**

**Memphis, TN**

**Gallaher Road Operations**

**Kingston, TN**

**Bear Creek Operations**

**Oak Ridge, TN**

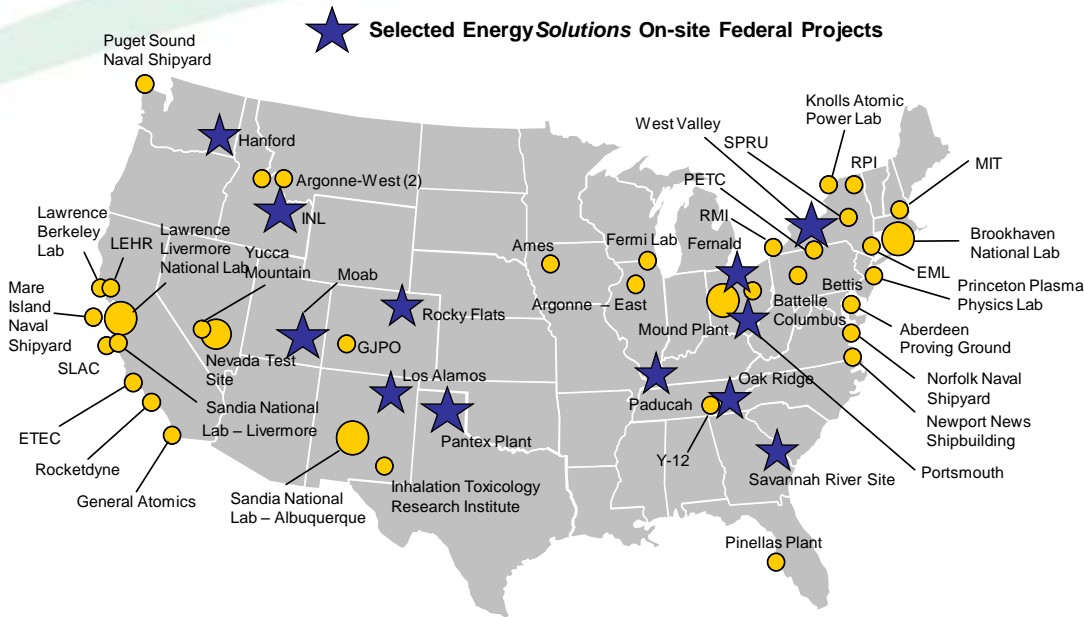
**Manufacturing Sciences**

**Oak Ridge, TN**

# Customized Solutions for Complex DOE and Federal Projects



## Location of Major DOE and DoD Nuclear Sites



## Nuclear Services Provided

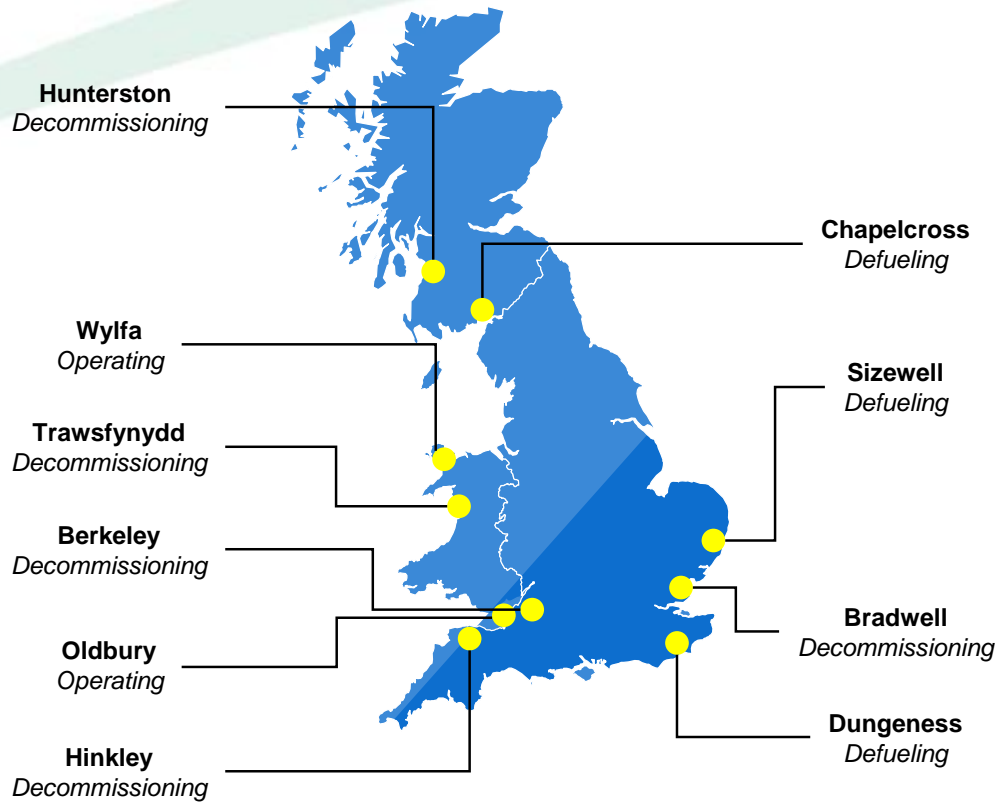
- Nuclear materials management
- Environmental and technology-driven cleanup
- Transportation and logistics
- Radioactive material treatment and disposal
- Facility management and operations
- Design, build, and operate one-of-a-kind nuclear facilities
- Professional engineering services for large nuclear facilities

We are a leading provider in the largest environmental cleanup in the world involving 2 million acres in 35 states

# Comprehensive Nuclear Services for the U.K. Government



- EnergySolutions manages 10 sites with 22 nuclear reactors for U.K.'s Nuclear Decommissioning Authority ("NDA"), providing reactor operation, de-fueling, waste management, and decommissioning services



**EnergySolutions manages all stages of reactor lifecycle**

- ▶ Magnox reactors
- ▶ Holds Nuclear Site Licenses
- ▶ Generation – 1600MW capacity – 4 reactors
- ▶ Defuelling – 8 reactors
- ▶ Decommissioning, demolition and disposal
- ▶ Intermediate level waste (ILW) retrieval and storage
- ▶ Major hazard reduction on sites
- ▶ Extremely talented employee pool in a resource-constrained industry
- ▶ Senior managers with alpha D&D experience in UK and US (Sellafield and Rocky Flats)

**Annual Funding - \$1B**



# Drivers for Virtualization



- Manage overhead costs per employee
  - 2 year ROI for V3 servers & software licenses
  - Annual cost reduction in devices from PCs to thin clients 60% savings
- Leverage IT commodities to company's advantage
  - Email Archive, secure near line storage, MS 360 migration
- Reduce data center footprint, energy consumption & costs
  - Virtualized servers 10 to 1 using VMWare
  - Reduced power footprint of V3 vs. traditional servers
- Shift IT's dependence on capital \$\$\$'s
- Decrease lead times for IT solutions deployment
  - Availability to deploy apps quickly to broad employee base
- Improve data security & redundancy
  - Two factor authentication
  - Central file store & backup
- Set the stage for "BYOD" to work
  - Policy & profile management through AD & RIM
  - Customer satisfaction vs. VPN using company issued PC



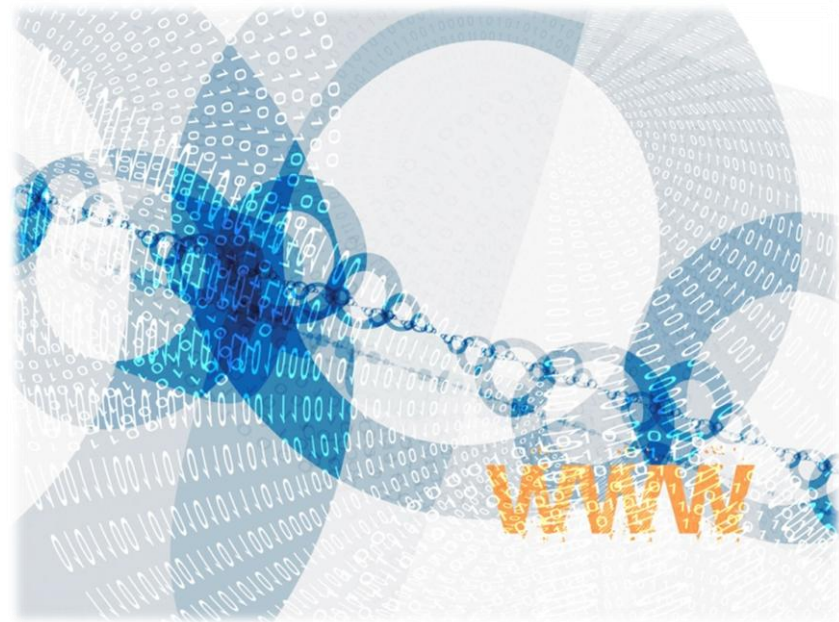
# Virtual Environment

- **Current**

- Oracle EBS
- Email archive
- CommVault backup
- File archives  
(nearline storage)
- Primary data center
- Virtual Desktop  
Infrastructure
- File Servers
  - 10 to 1

- **In Process**

- Office 360
- Secondary data  
center
- Oracle OBIEE



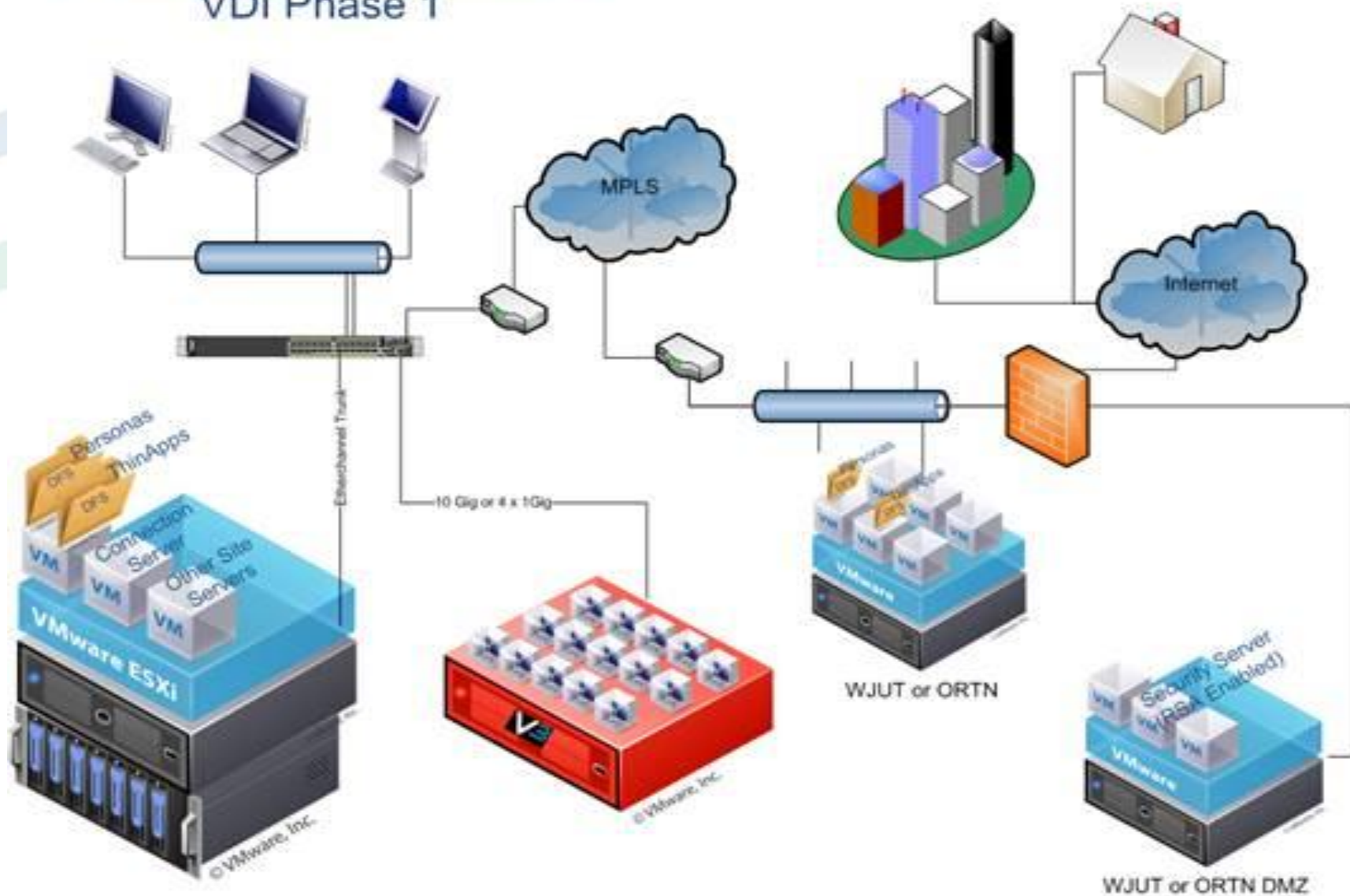
# VDI Pilot Project

- 50 Internal employees, US geographically dispersed
- Standard office worker
  - Electronic Mail
  - Microsoft Office (Word, Excel, PowerPoint)
  - SharePoint and Mapped Drives
  - Web Browsing
  - Oracle EBS
  - Few or No additional program needs
- Fixed office location
- Utilize the ServiceDesk for support needs





## Typical Site Configuration for VDI Phase 1



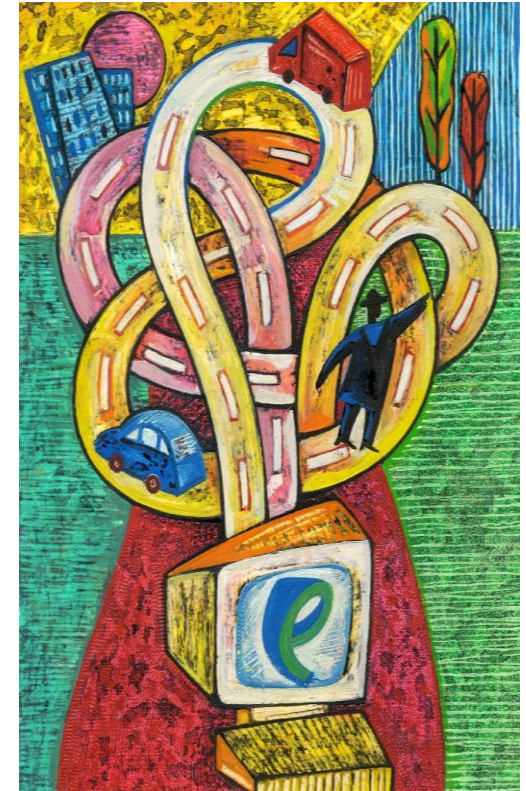
# VDI Toolkit

- Standard Office worker
- Riverbed WAN optimizers
- Dedicated high-speed internet (for home users)
- VMWare 5
- Enterprise & local SANs
- Network Access Controller
- VDI Management Console
- V3-V12 servers (w/Fusion IO embedded)
  - V3 up to 75 desktops; V8 supports 75-80 desktops; V12 supports 150 desktops
- 10 Zig thin client devices
- RSA Tokens



# Virtualization Challenges

- Bandwidth is King
  - Urban vs. rural bandwidth in office locations
  - Home & traveling internet access
  - Hybrid environment for staged deployment
  - Most international air travelers have no internet access
- Culture shift
  - Employees:
    - Verbiage confusion...what does “virtual” mean
    - Fear loss of control
    - No touch screen navigation through VMWare for iDevices
    - Initial confusion over location of files
  - IT Support team
    - Confusion over terminology
    - Front line support enjoys working on PCs & Laptops
      - New model is 10Zig + Monitor & keyboard
    - Deployment of applications
    - Training on VM tools
  - Legal
    - Contracts for compliance, privacy & security
    - Legal discovery shift



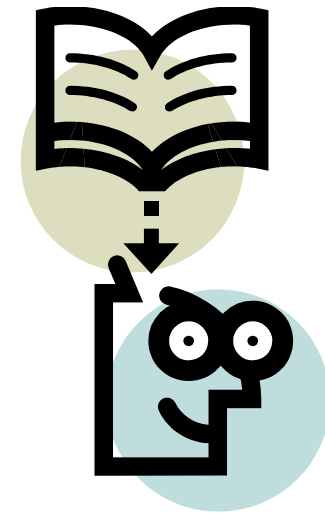
# Successes

- User experience through V3 running VMWare is fast
  - eliminates I/O choke point
- Easy adoption and integration of VMWare tools by IT
- Full replacement for legacy systems deployed with Citrix
- Patching and deployment of new apps smooth and effective
- Able to retain functionality of TeamViewer for “remote” support of virtual desktops
- File locations seamless to employees
- Home use is very positive
  - faster than VPN
  - people like having access to their desktop
  - tokens are a bit complicated, but everyone is adjusting



# Lessons Learned

- Implication of changes on a group vs. individual PCs for Helpdesk
- Redundancy of virtual images locally & failover to remote site
- Dual monitor use requires special configuration
- Printer setups
- Implication of VMW “timeouts” to employees
- Employee training on navigation differences for touch screen devices
- Definition of terminology
  - Remove the “geek speak”
- Replace clunker PCs with 10Zig
  - VDI on a clunker, still a clunker





# Questions



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